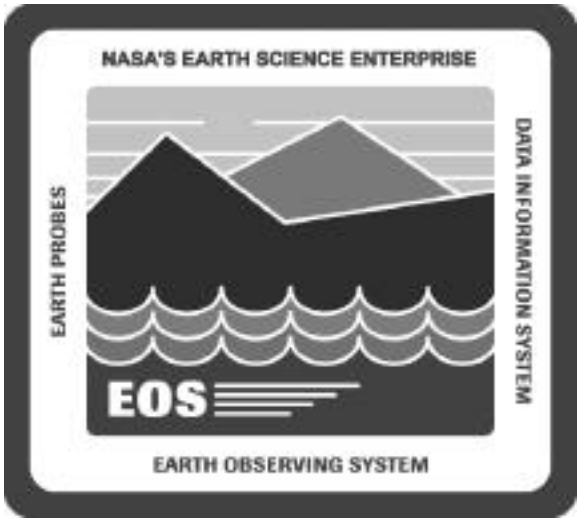


ECS SDPS Incremental Release Review for 5B

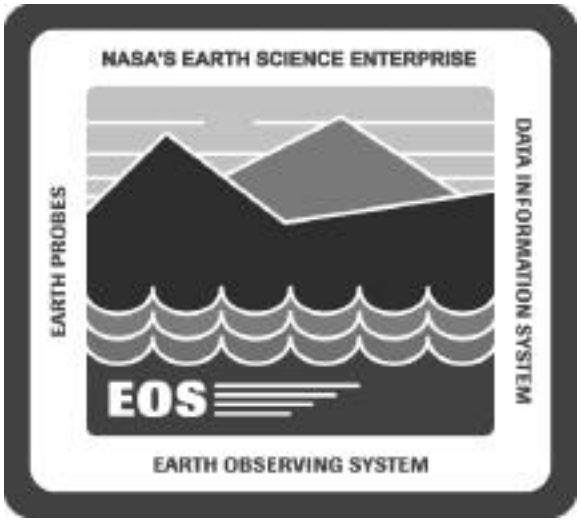
18 August 1999

Raytheon Raytheon Systems Company

704-CD-510-001

The ECS SDPS Incremental Release Review (IRR) has been planned, managed, and conducted by Farzad Davarya.

Please forward questions and comments to fdavarya@eos.hitc.com

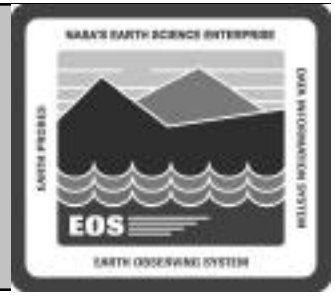


IRR Overview

Mark McBride

Raytheon Systems Company

IRR Objectives

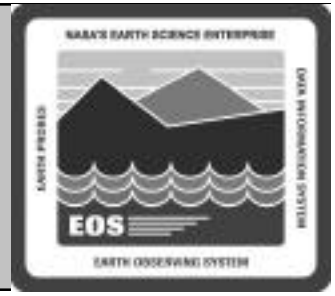


- **System Requirements Review**
- **Requirements Verification Traceability (Test Planning)**
- **Preliminary Design Information**
- **Key 5B Development Lifecycle Changes**

Results in:

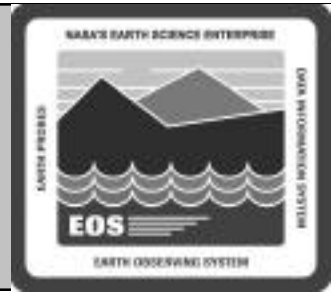
Customer approval to proceed

IRR Agenda



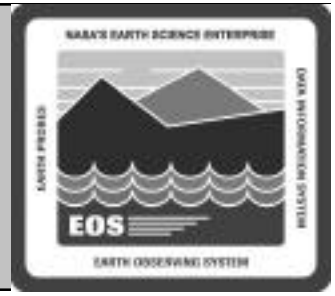
• Overview	M. McBride	9:00 AM
• Requirements	R. Meyer	9:20 AM
• Design		
– Development Overview	M. Armstrong	10:00AM
– Operations Concepts		
—ASTER On Demand	C. Bories	10:10 AM
• Break		10:40 AM
—ASTER GDS Interoperability	G. Swope	10:50 AM
—Java DAR Tool (JDT) Update	M. Pelletier	11:20 AM
—Landsat 7 Subsetting (Band and Floating Scene)	A. Siyyid	11:50 AM
• Lunch		12:20 PM

IRR Agenda (Cont.)



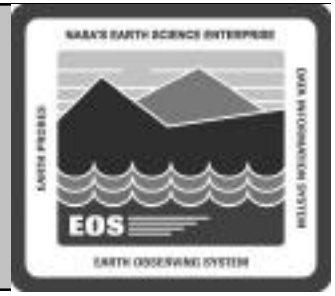
– Operations Concepts		
—Landsat 7 Floating Scene Price Estimate	G. Swope	1:00 PM
—ECS Core and PSAs	J. Chang	1:30 PM
—Production Rules	M. Mauthe	2:00 PM
—Update ESDT	A. Dupree	2:30 PM
• Break		3:00 PM
—Restricted Granule Access	J. Cockey	3:15 PM
– COTS S/W and H/W Additions and Upgrades	J. Delauter	3:40 PM
• Test	B. Kniffin	4:00 PM
• Wrap-up/Summary	M. McBride	4:20 PM

ECS SDPS Development Lifecycle



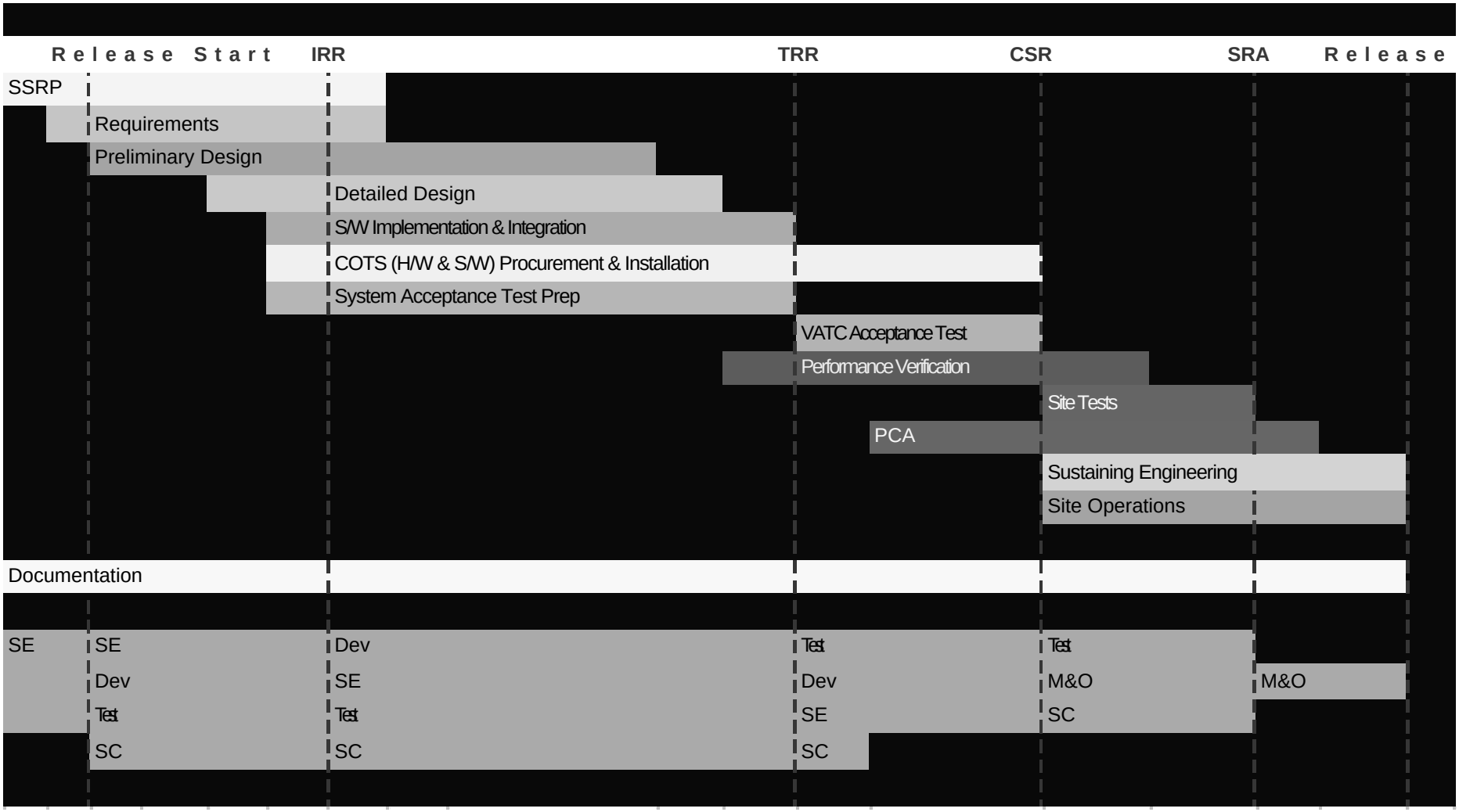
- Systems Engineering
- Development
- Science Office
- Test Engineering
- M&O
- QA

Key 5B Milestones

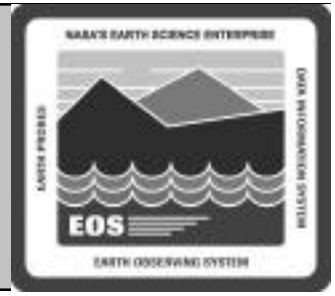


- **Incremental Release Review (IRR)**
- **Test Ready Review (TRR)**
- **Consent to Ship Review (CSR)**
- **Site Readiness Assessment (SRA)**

ECS SDPS Development Lifecycle

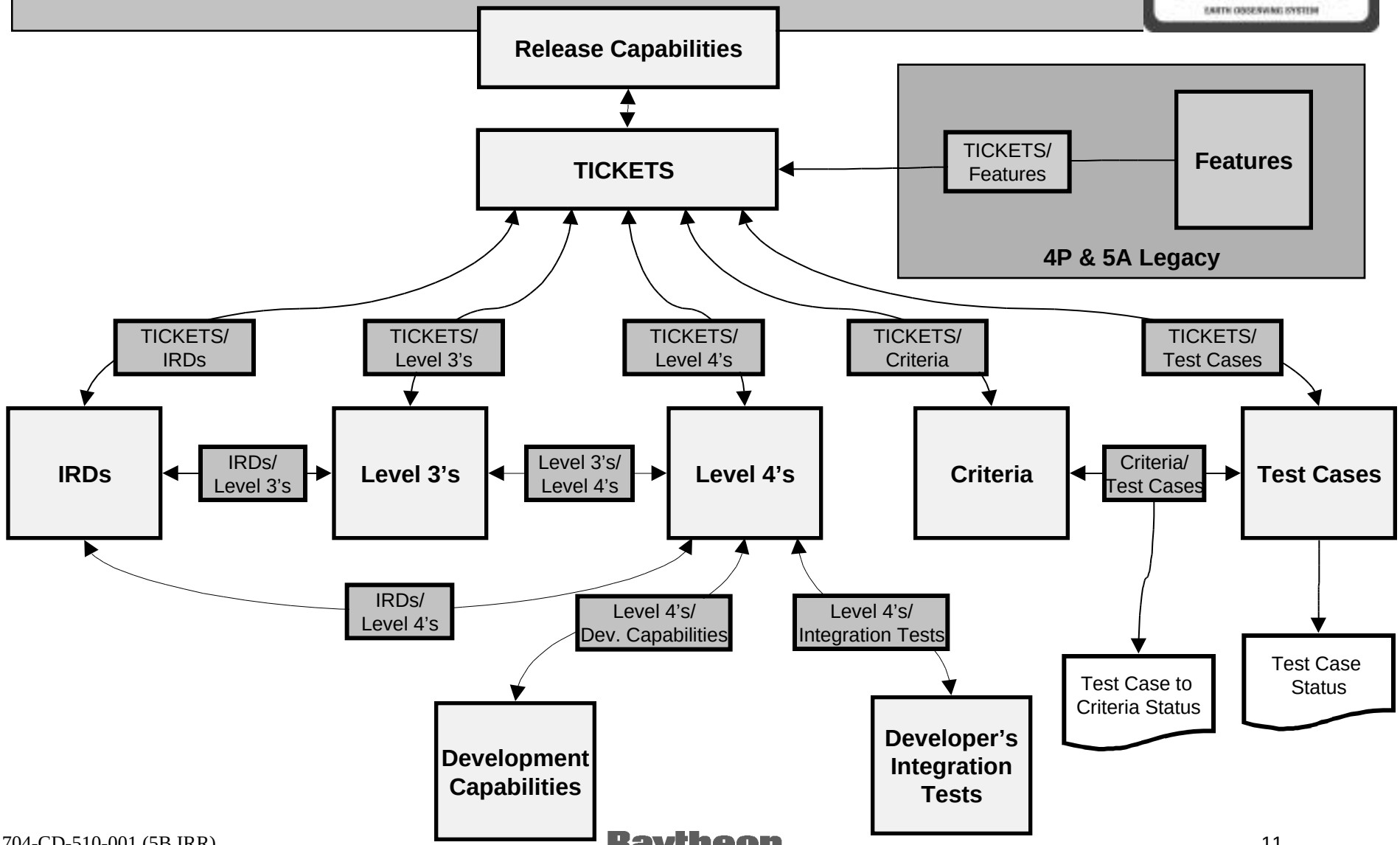


Requirements and Design Process

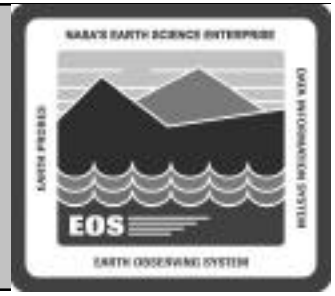


- L4 requirements derived from L3 requirements
- Tickets created for test verification purposes
  - Set of acceptance criteria for Functional Components, Error Conditions, and Performance Criteria
  - Mapping to capabilities
  - Mapping of L4s
- Tickets map to single release capabilities to single tests (where possible)
- Standard ESDIS approval cycle

5B-era Verification Database Schema 7/27/1999

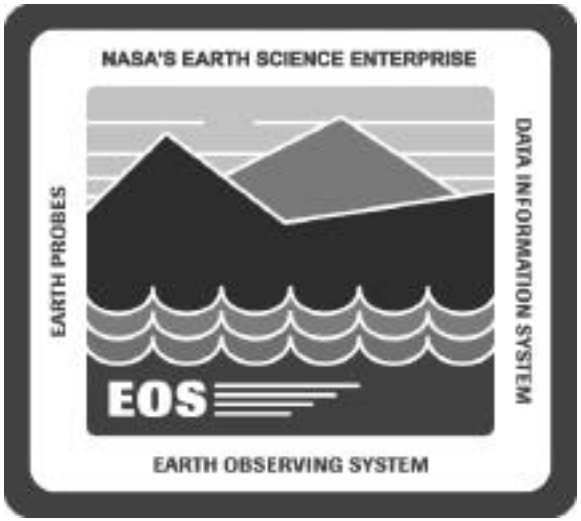


Quality Assurance for 5B



QA is an integrated team member during the entire life cycle

- **Planning**
  - **Documented plan allocating resources to functional areas**
  - **Schedule of QA Activities**
- **Evaluations**
  - **Audits and Product Evaluations**
  - **Evaluation Criteria**
    - **—Preparation, Execution, and Follow Up**
  - **Evaluation Process**
- **Deficiency Reporting**
  - **Database**
- **Status Reporting**
  - **Metrics**
- **Other Project Activities**



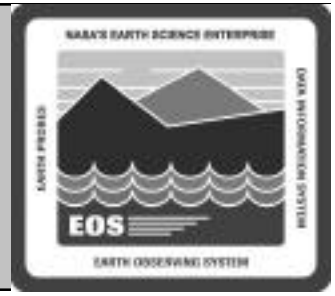
Requirements

Richard Meyer

Raytheon Systems Company

704-CD-510-001

Briefing Overview



Briefing Objective

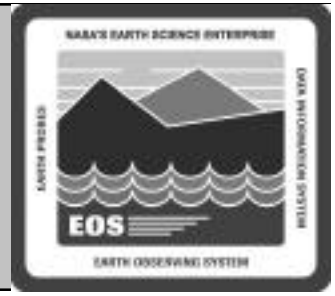
Mission Requirements

ESDT Requirements

Ramp-up Capacities

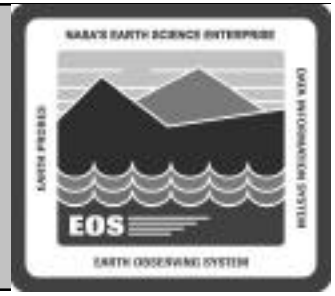
Release Capabilities

Mission Requirements I
Pre-5B Mission Capability



- External interfaces (EDOS, Landsat 7, DAO, ancillary data)
- SIPS Interfaces (LaTIS, ACRIM, SAGE III, MODAPPS)
- Archive and retrieval of Terra and Landsat 7 products
- Archive and retrieval support for ACRIM & SAGE III products
- Terra science software integration and test
- Automated processing of MODIS L1, ASTER and MISR standard products
- ASTER DAR/DPR Scheduling through the JAVA DAR Tool
- Expedited data service
- Operator-assisted science QA
- User interface (EOS Data Gateway) for search, browse, and data order (limited metadata search) and DAR submission
- Media (8mm tape) and electronic data distribution
- Landsat 7 fixed scene subsetting
- Operator-assisted ASTER on-demand processing
- Operator-assisted subscriptions

Mission Requirements II
New 5B Mission Capability



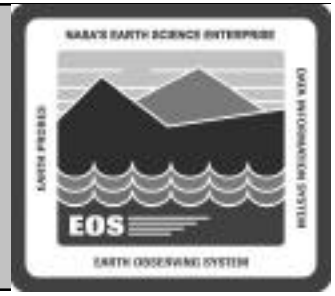
- **Terra Production Capacity**
  - **1x for L1 and 0.75x for Higher Level Production**
- **SSI&T Support for PM-1 (including production rules)**
- **Archive and retrieval support for PM-1 L0 (EDOS)**
- **Landsat 7 Floating Scene, Band and non-image product subsetting**
- **2-way interoperability with GDS for Product Search and Orders**
- **Enhanced Client Data Access (PSA's, ECS Core, Integrated Browse)**
- **Operational Data Transition in Support of Software Releases**

ESDT Requirements

Instrument	Number of new ESDTs
ACRIM	5 (delivered in 5A)
AIRS	90(delivered in 5A)
AMSR ADEOSII	1
AMSR PM1	27
CERES PM1	12
MODIS PM1	657

1 new ESDT needed by development for ESDT Update functionality

Updates to ESDT descriptor files



- **No descriptor file changes anticipated**
- **Changes to the Landsat 7 DLLs will be required to support the Floating Scene Subsetting**

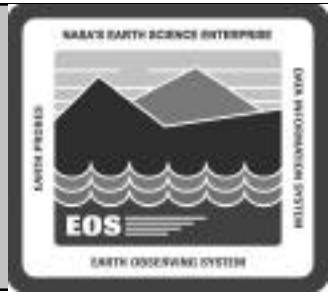
Ramp-up Capacities

	Archive Volumes GB / 6 Months	# of Granules # / 6 Months	Processing Power MFLOPS
EDC	95300	1256700	908
GSFC	125600	1012000	5250
LaRC	60160	562900	6080
NSIDC	4050	197600	32

	Archive Volumes Cumulative TB	# of Granules Cumulative '000s	Distribution	
			Network GB / Day	Tape GB / Day
EDC	251	2660	194	159
GSFC	303	2210	226	226
LaRC	148	1348	109	109
NSIDC	8	364	6	6

Notes: Baselined Capacities at the End of '00
Does not include known MISR & MODAPS baseline details

EDC System Overview



Java DAR Tool

DARs

Data / Services

ASTER GDS

User Search and Order

EOS Data Gateway

Communications and Internetworking

GDS Gateway

Authorization Check

Search and Order

Interoperability

Mgmt Subsystem

Planning Subsystem

Data Processing Requests

Advertisements

Data Mgmt Subsystem

Notifications

Data Processing

L7 Orders

Data / Services

Data Server Subsystem

Data

Ingest Subsystem

Approved L7 Orders

Science Software & Data

Acquire Data

Insert and Retrieve

Data Collections

DORRAN

Data Distribution

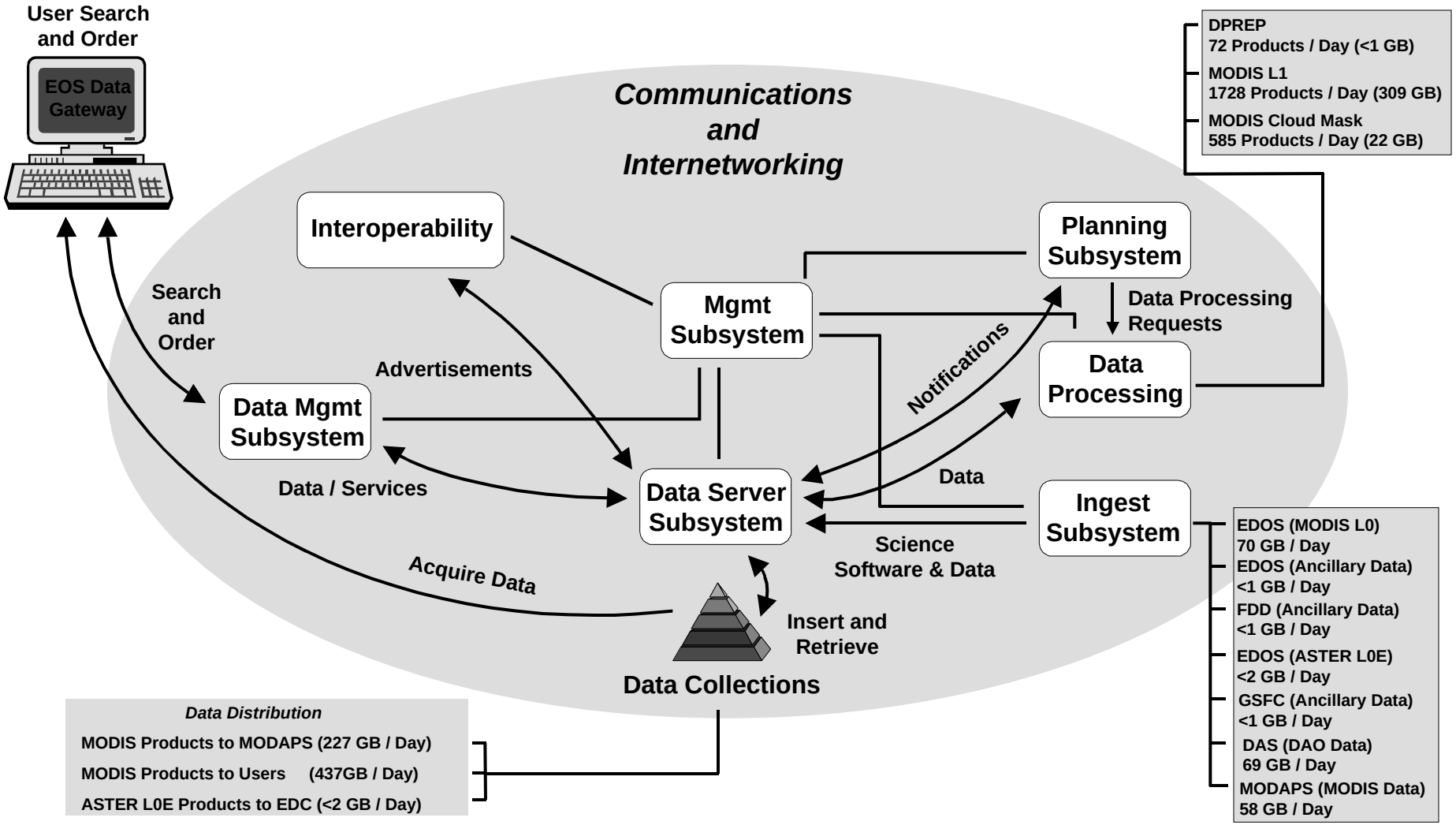
- 100 L70R Scenes / Day to Users (50 GB)
- 10 L70R Scenes / Day to IAS (5 GB)
- CCA Metadata to MOC (<1 MB / Day)
- ASTER Products to Users (193 GB / Day)
- MODIS Products to Users (154 GB / Day)

- ASTER Routine
  310 DST / Day (26 GB)
- ASTER on Demand
  320 Products / Day (31 GB)
- ASTER DEM (Manual)
  1 / Day

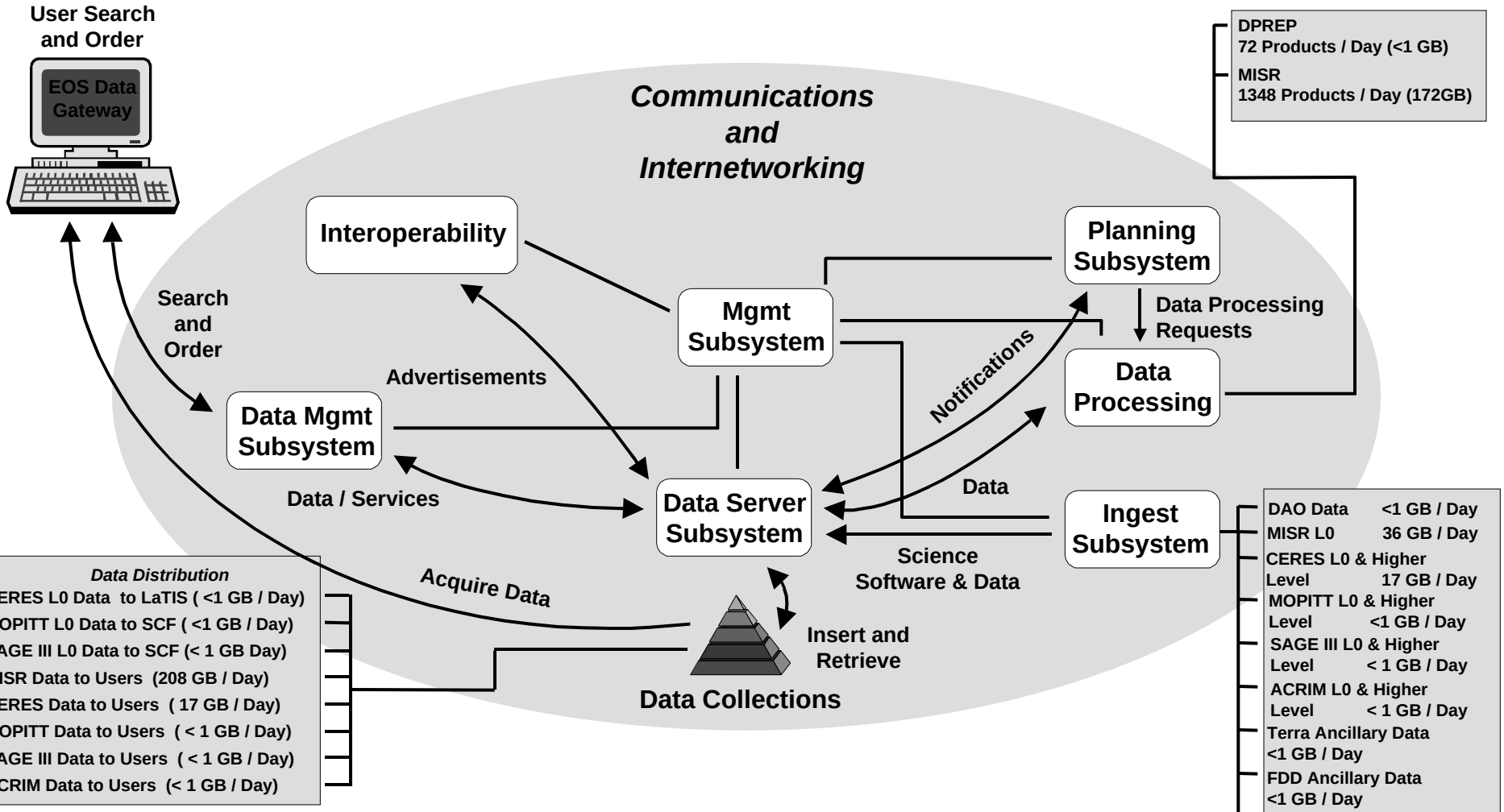
- LPS (L70R F1, F2)
  140 GB / Day
- ASTER GDS (L1A, L1B)
  136 GB / Day
- L7IGS (M.Data & Browse)
  575 scenes < 2GB/day
- L7IAS (CPF) < 1 MB / Mo
- GSFC (Ancillary)
  <1 GB / Day
- GSFC (ASTER L0E)
  <2 GB / Day
- MODAPS (MODIS Land Products)
  154 GB / Day

Raytheon

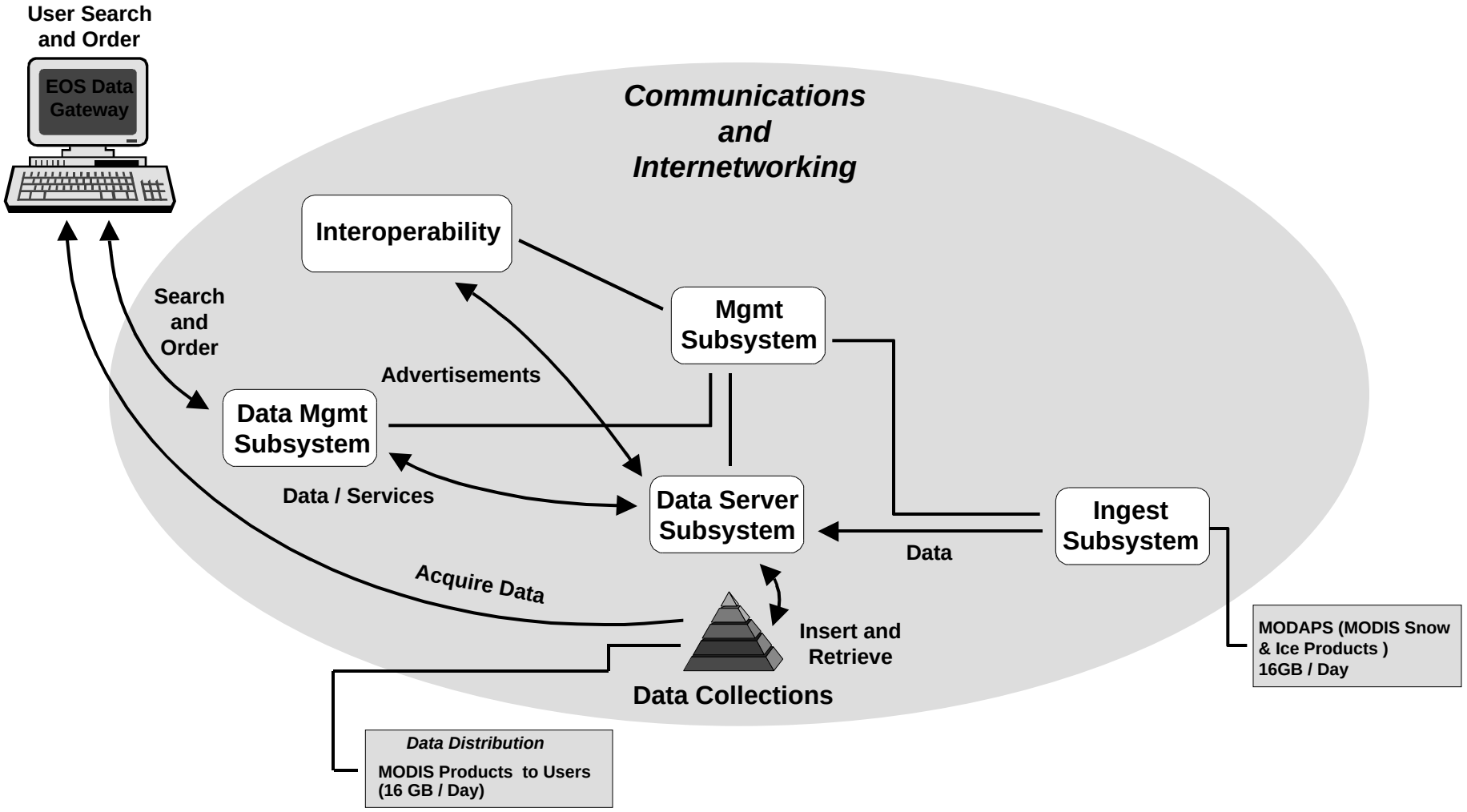
GSFC System Overview



LaRC System Overview



NSIDC System Overview

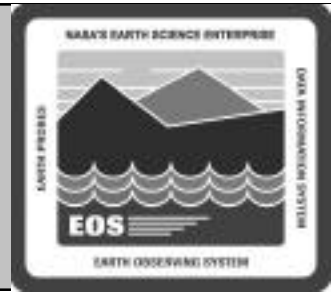


New Release Capabilities

ECS-GDS Gateway *[01810, 01954, 12005-120018]*

- **Bi-directional Search, Browse, Order**
- **Price Estimates, Order Status from GDS**
- **Tool for Valids Exchange and Mapping**
- **Side Effects**
  - **Distributed V0-Search Management**
  - **Distributed Order Tracking**
  - **All Collection Info Needed at EDC**

Release Capabilities



ASTER On-demand Processing *[10501]*

- Replaces Manual Workaround
- Emphasis on
  - Quick Turnaround for Order Acceptance & Planning,
  - Automation, Robustness, Operations Support
- Issues
  - GDS Valids for Populating Product Requests for On-Demand L1B
  - Integration Between EDG and On-Demand Processing Order Forms (ODFRM)

ASTER DEM & L1B Browse *[10501]*

- Automatic Use of L1A Browse for L1B and DEM

Release Capabilities

Science User Interface

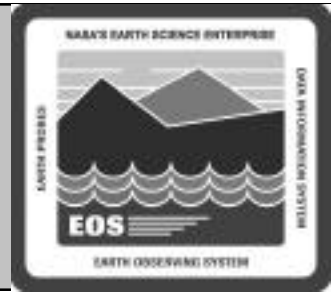
- Landsat 7 Partial Subintervals & Pricing *[12500, 12512, 12513]*
  - Side Effect: Staging resources
- Lat / Long Boxes and Oriented Gpolygons *[12501, 12504]*
  - Side Effect: Corrects Global Rectangle Handling
- Search / Display of all ECS Core Metadata and PSA *[12004]*
  - Side Effect: Invalidates Some SDSRV Performance Enhancements
- Integrated Browse *[01680]*
- Java DAR Tool Enhancements: DAR Queries, Status *[03322]*

Science Processing

- Closest Granule, Spatial Padding, AIRS Orbital Processing, PM-1 DPREP *[00964, 00967, 10500, 11002]*
- Toolkit Ports: C++; Multi-Threading *[11500, 11501]*

Ingest Tailoring

Release Capabilities



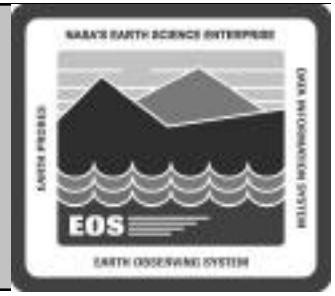
Restricted Granule Access *[12502]*

- Support User Groups
  - Privileged & Regular NASA, Non-NASA
- Configurable Access Rules Based on QA Status
- Configurable QA Time Interval
- Plus Access Restriction for Individual Collection
- Side Effect
  - User profile handling

Other Security Enhancements

- Authorization for On-Demand ASTER L1B *[10501]*
- Encrypt Stored Passwords

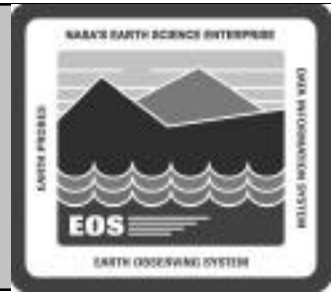
Release Capabilities



Update ESDT *[12514, 01563]*

- Add / Replace Services, Events
- Add Collection and Optional Inventory Attributes
- Change Values (“Valids”) of Wide Range of Collection Attributes
- Support “Master” Descriptor for “Entity” Attributes
  - Simplifies maintenance
  - Example: Contact
- BUT
  - Not intended for use when ESDT should be versioned
  - Excludes ability to delete

Release Capabilities



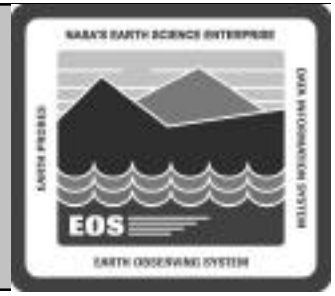
Operability & Robustness

- **Improvements to Landsat F1/F2 Error Handling *[12503]***
- **Improved Recovery and Visibility of L7 Orders *[12506]***
- **Improvements to Subscription Server Robustness & Restart *[04435]***
- **Logging & Shutdown Enhancements in DMS *[12001]***
- **Ingest Request Cancellation *[00050]***

Performance

- **Separate Subsetting Queue (“Heavy Requests”) *[12506]***
- **Multi-thread Subscription Processing *[04435]***

Issues



Aster GDS Interface

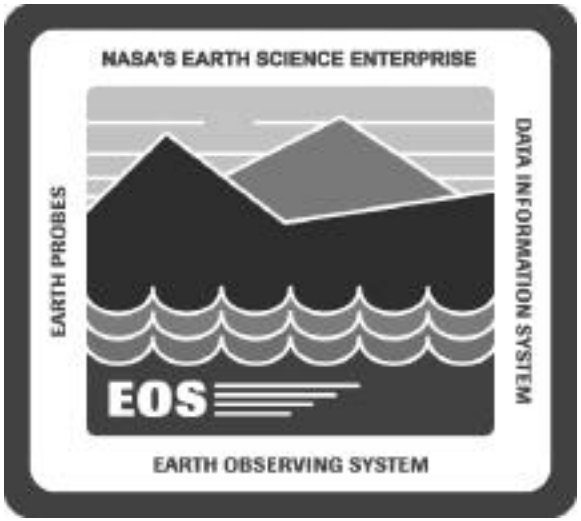
- **L1B product request valids; V0 integration**

DPREP

- **Requirements details**

Landsat Pricing

- **Impact of proposed scheme**

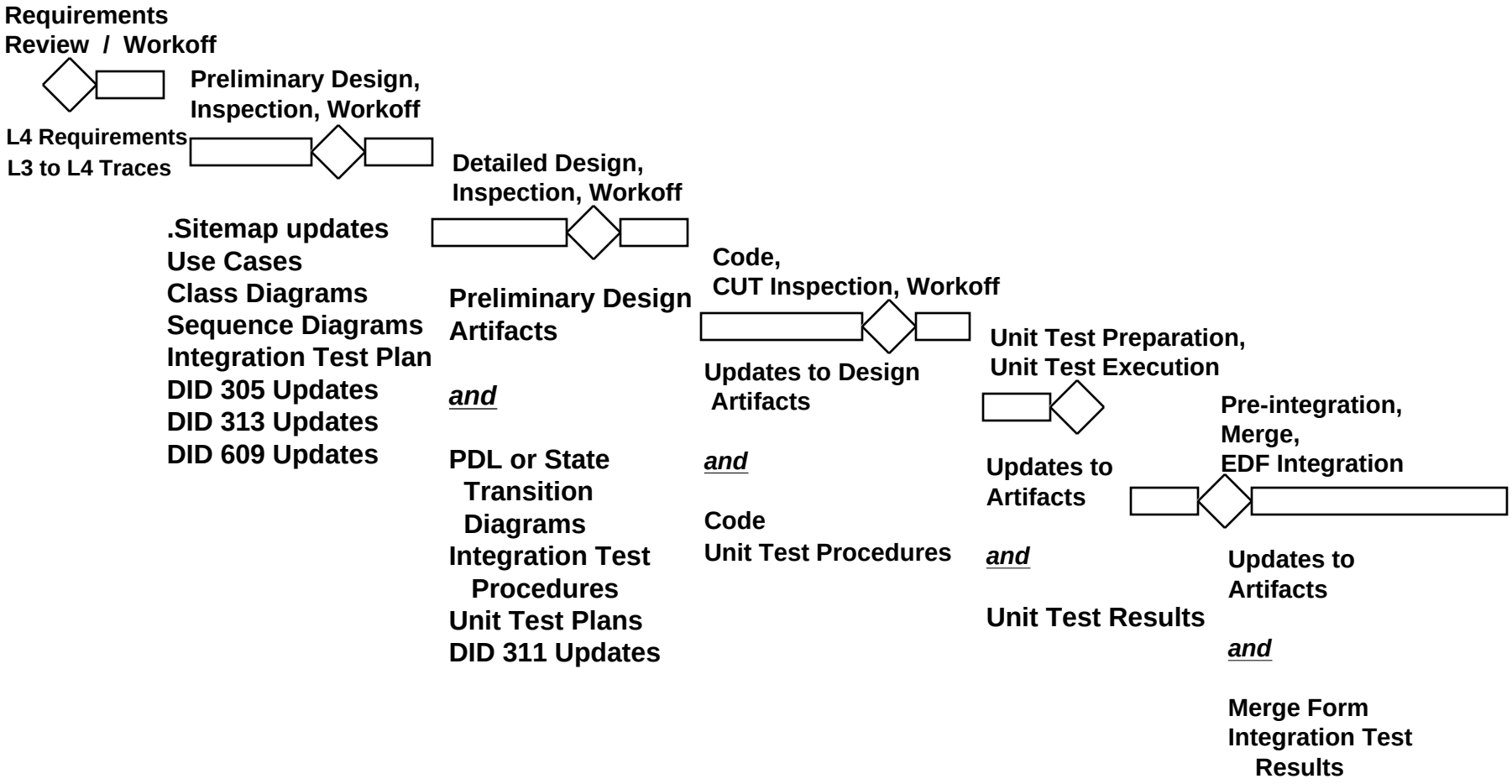


Development Overview

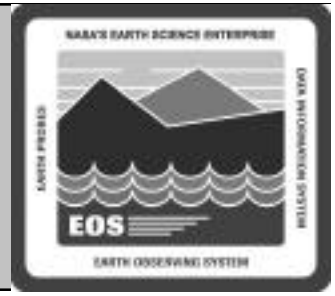
Mary Armstrong

Raytheon Systems Company

Development and Integration Approach

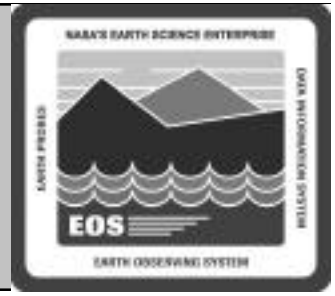


5B Capability Status



	Completed	Total
Requirements Reviews	40	41
Preliminary Design Inspections	32	44
Detailed Design Inspections	20	51
Code Inspections	15	52
Unit Test Executions	11	52
Merges	9	52
Integration Activities	2	35

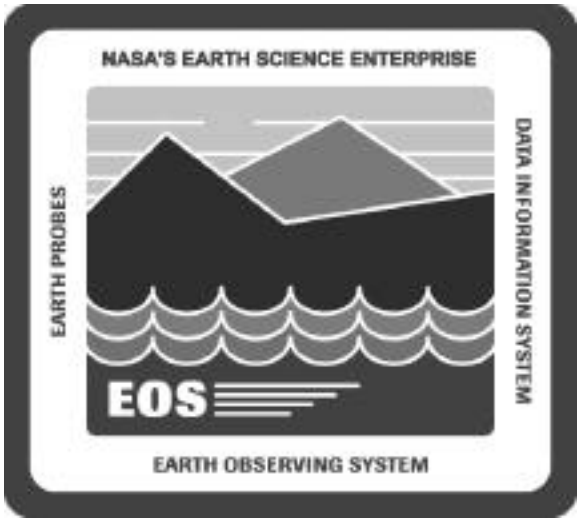
Development Presentation Agenda



Presentations cover new capabilities that are significant in scope or system impact

Each briefing will have the following agenda:

- **Requirements Summary**
- **Design Changes**
  - **Key Drivers**
  - **Hardware / Software Changes**
  - **Interaction Diagrams**
- **End User Interactions**
- **DAAC Operations Impacts**



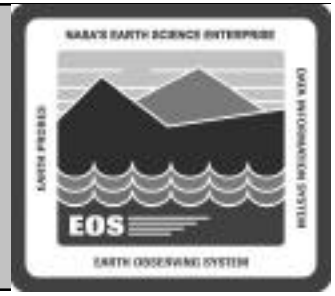
ASTER On Demand

Cristina Bories

Raytheon Raytheon Systems Company

704-CD-510-001

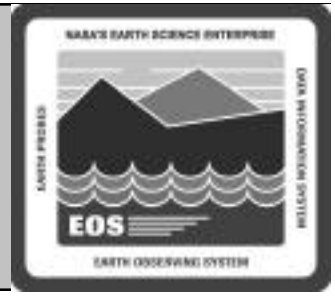
Requirements Summary



Allow users to submit requests for the creation of ASTER High Level products, DEMs and non-standard L1B.

- **ASTER On Demand supported by requirements in CLS, PLS, DPS, and MSS subsystems.**
- **CLS introduces a new HTML interface (new CSCI - ODFRM) to collect the user specified parameters for the ASTER On Demand request.**
- **PLS introduces a new server (new CSC - ODPRM) which creates and queues production requests.**
- **DPS updates status for High Level processing On Demand requests**
- **MSS supports order tracking database for On Demand requests.**
- **Sized for ~300 On Demand processing requests per day**

Key Design Drivers



User Interface

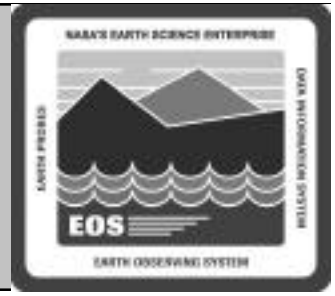
- Three different product types - One interface
- Immediate checking of data entry errors
- Meet budget - Leave EDG client alone and provide a standalone HTML interface specific to ASTER on demand products

Planning

- Handle increased volume - Automated scheduling of requests approach, independently of routine production
- High Level On demand requests submit with higher priority than routine processing
- Automated aging of requests

Effective reuse of existing ECS capabilities

Key Design Drivers (cont.)



Processing

- Priority for High Level On Demand products
- Independent throttling of On Demand High Level products

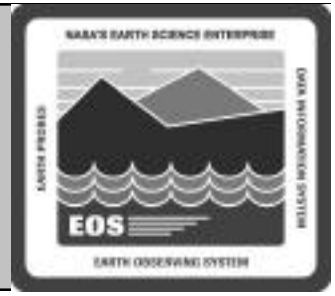
Order Tracking

- Provide interface so that operators can determine up to date status
- Automate tracking at the granule level
- Provide interface to cancel On Demand requests

Distribution

- Distribution of requests through normal means

New SW Components
EDC DAAC



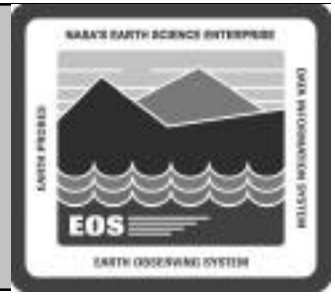
ODFRM - New CSCI in Client Subsystem

- Provides HTML interface
- Cut and Paste interface with EDG client
- CGI programs interface with Planning Subsystem
- Resides with other Client applications on INTHW CI

ODPRM - New CSC in Planning Subsystem

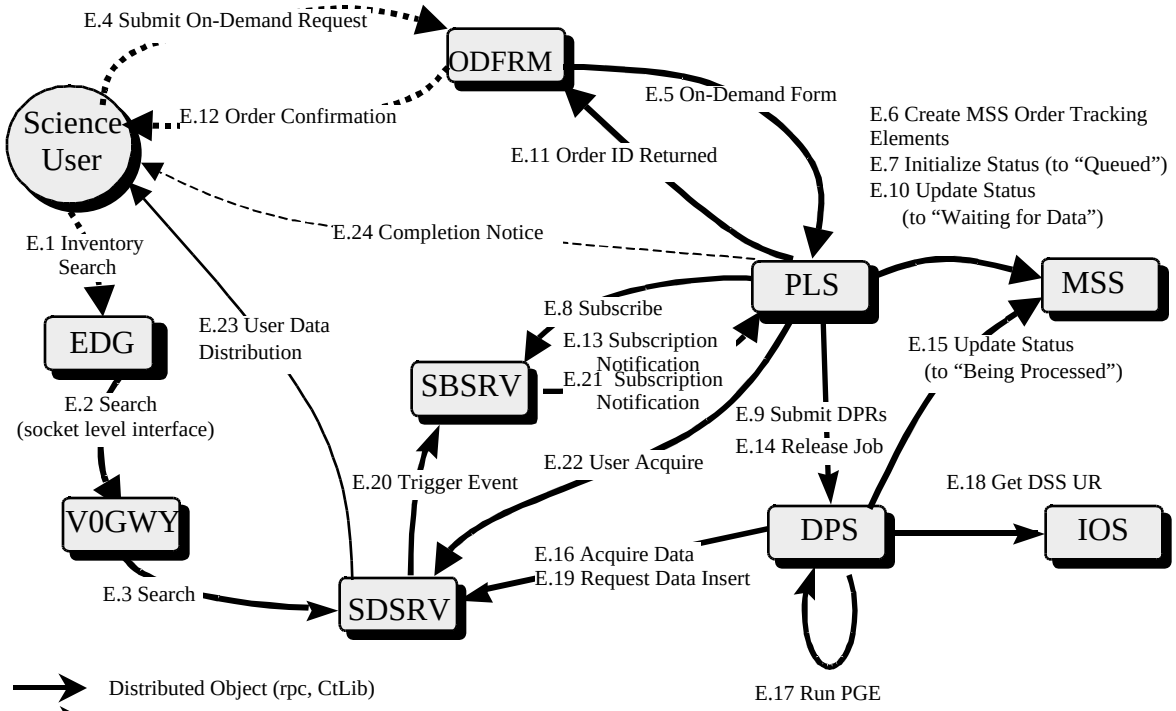
- Receives requests from ODFRM
- Creates order tracking elements (orders and requests) with MSS
- Creates production requests
- Initializes/updates status of the order tracking elements
- Queues production requests until all inputs are available

New SW Components
EDC DAAC



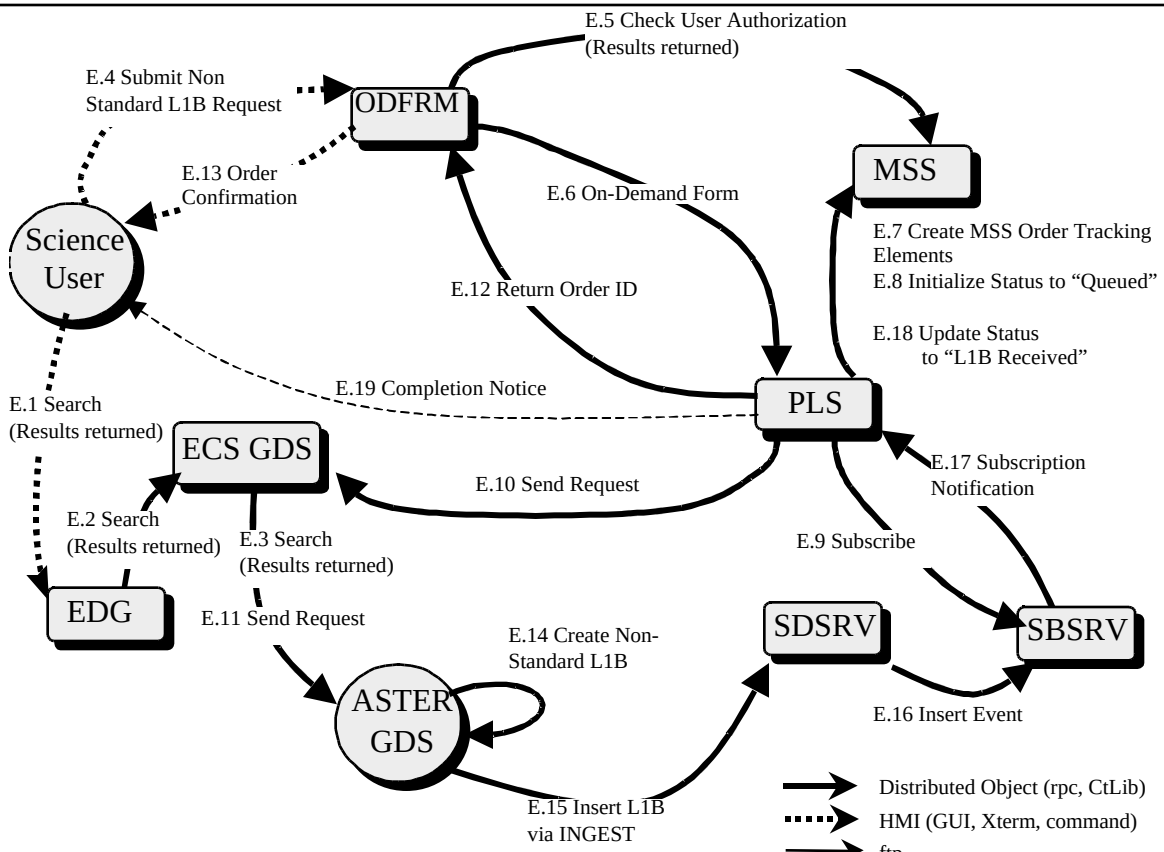
- **Automatic expiration of ASTER High Level products requests (configurable)**
- **Resides in Planning workstation with other Planning applications.**

ASTER Higher Level Product Interaction Diagram



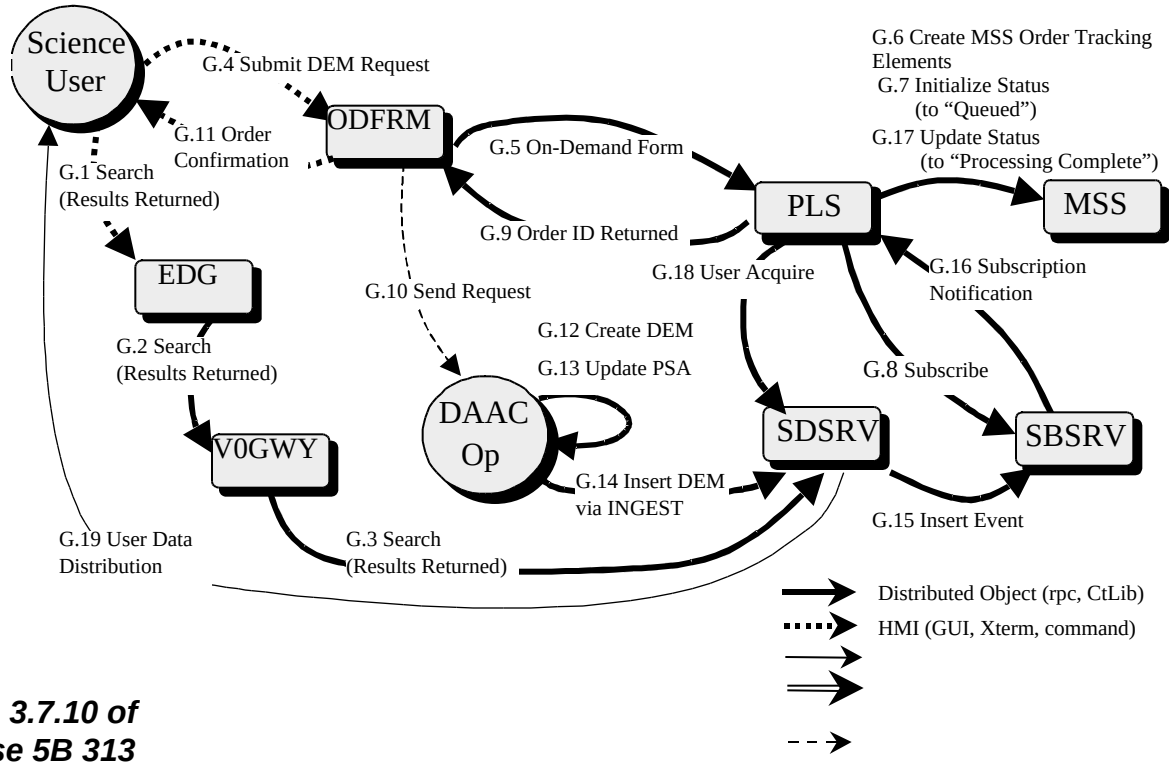
See section 3.7.8. of draft Release 5B 313

ASTER Non-Standard L1B Interaction Diagram



See section 3.7.9 of draft Release 5B 313

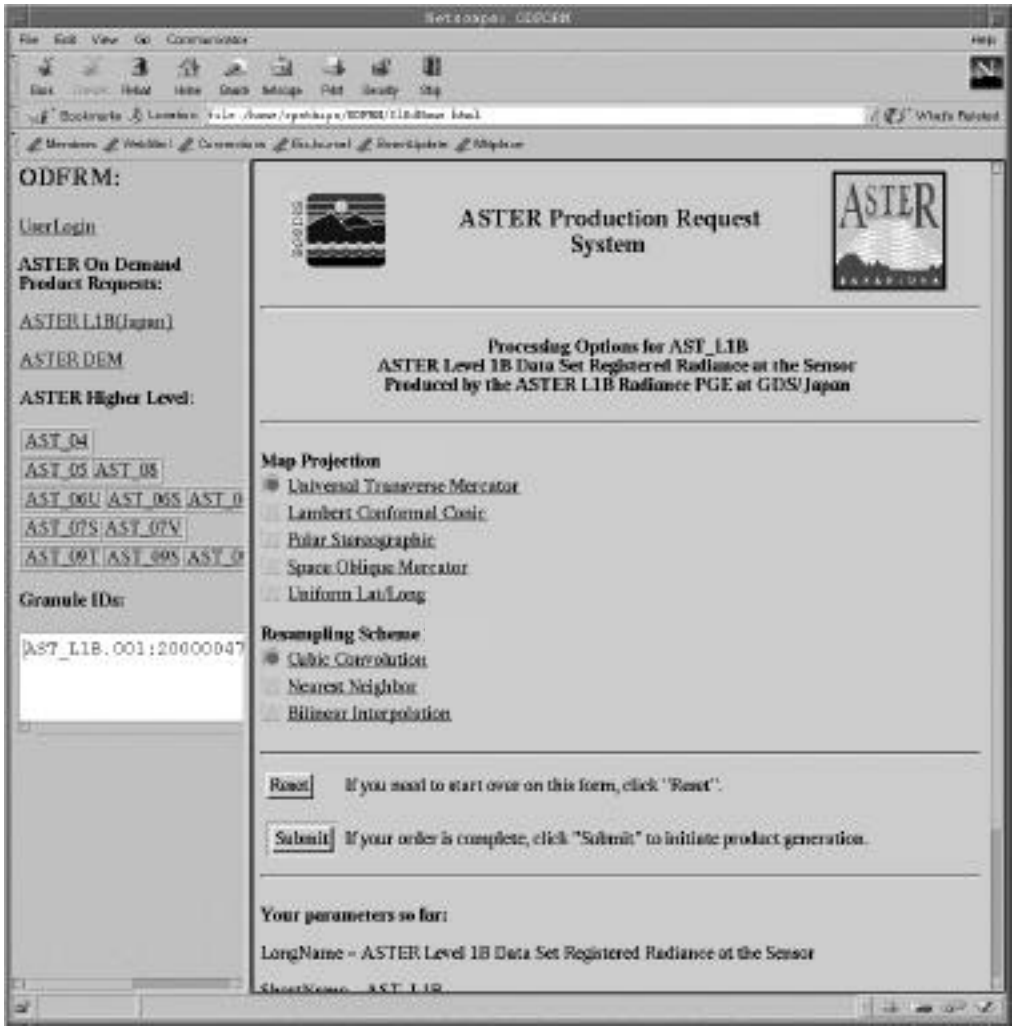
ASTER DEM Interaction Diagram



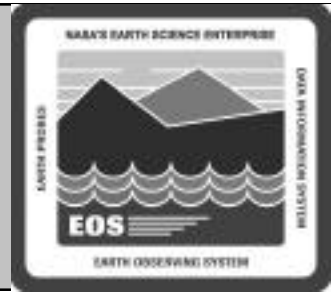
See section 3.7.10 of draft Release 5B 313

End User Interface

End User Interface



Operational Impacts



Production planning

- **Operators will no longer have to generate on demand production requests from user e-mails for High Level processing.**
- **Adds non-standard L1B production**
- **The system will know the profiles involved in ASTER production.**

User Services

- **Ability to track progress for On Demand requests.**
- **Adds the ability to cancel an On Demand request from the MSS order tracking GUI.**
- **Parameters for every On Demand request are stored into database. Accessible to operators via scripts.**
- **Automated distribution**

Configuration Parameters

- **Order expirations, timers for deletion, throttling parameters**

Order Tracking User Interface